

**Title**

Inundation Maps for NSW Inland Floodplain Wetlands 2019-2021

**Abstract**

Under the NSW DPIE-EES Environmental Water Management Program the distribution and extent of inundation is monitored in large inland floodplain wetland assets which are targeted for environmental flow delivery and located in the NSW portion of the Murray-Darling Basin: Gwydir wetlands, Lowbidgee floodplain, Lower Lachlan wetlands, Macquarie Marshes, and Barmah-Millewa Forest. Inundation maps are derived from image observations sourced from the satellite data sources of Landsat (30m pixel) and Sentinel-2 (10m pixel) for the period July 2014-June 2019. Image observations are automatically downloaded by NSW DPIE from the USGS (United States Geological Survey's Earth Explorer website (<http://earthexplorer.usgs.gov> ) and the Copernicus Sentinel Open Access Hub (<https://scihub.copernicus.eu/dhus/#/home> ) as orthorectified images. NSW DPIE process these images to standardised surface reflectance (Flood et al. 2013). Image observations with high cloud coverage (>50%) are not considered because they cannot be processed. The inundation mapping procedure is a modified version of Thomas et. al (2015) which is a method to map inundation in vegetated floodplain wetlands using an integrated spectral response to water and vigorous vegetation. From each satellite image observation NSW DPIE-EES automatically generates a water index (Fisher et al. 2016) and the NDVI vegetation index. These indices are used to allocate inundated pixels to classes of open water, mixed water and vegetation, and dense vegetation cover that was inundated (Thomas et al. 2015). A process of pixel recoding is conducted to produce each inundation map. First all inundation classes are merged and allocated a value of one (1) whilst all other pixels are allocated a value of zero (0). Second, ancillary data is then used to identify irrigation infrastructure to do two things: locate inundated pixels within off-river storages (ORS) by recoding to a value of (2) and to remove cropped areas that have similar spectral properties to wetland vegetation by coding the pixels to a value of zero (0). Third, for observation dates affected by cloud shadow, which is often incorrectly detected as water, pixels are manually reclassified as cloud shadow by recoding them to a value of three (3). The final inundation classes are inundated (1), off-river storages with water (ors) (2), cloud shadow (3), and not inundated (0). Final inundation maps are clipped to the inland floodplain wetland boundaries.

The naming format of the files are: Wetland\_date  
\_sensor\_inundation1\_ors2\_cloud3.tif or Wetland\_path\_date  
\_sensor\_inundation1\_ors2\_cloud3.tif

Wetland: bm = Barmah Millewa floodplain gw = Gwydir floodplain lachlan = Lachlan floodplain lo = Lowbidgee floodplain mm = Macquarie Marshes floodplain

Path: Specific to the Lachlan Date: Satellite image date processed Sensor: Sensor type- l7 (Landsat7; l8 (Landsat 8); s2 (Sentinel2) Inundation1: Inundated ors2: Off-River Storage with water cloud3: Cloud shadow (in filename if present)

References: Fisher, A., Flood, N. and Danaher, T. (2016). Comparing Landsat water index methods for automated water classification in eastern Australia. *Remote Sensing of Environment*, 175, 167-182.

Flood, N., Danaher, T., Gill, T., & Gillingham, S. (2013). An operational scheme for deriving standardised surface reflectance from Landsat TM/ETM+ and SPOT HRG imagery for eastern Australia. *Remote Sensing*, 5, 83-109.

Thomas, R. F., Kingsford, R. T., Lu, Y., Cox, S. J., Sims, N. C. and Hunter, S. J., (2015). Mapping inundation in the heterogeneous floodplain wetlands of the Macquarie Marshes, using Landsat Thematic Mapper. *Journal of Hydrology* 524, 194-213.

**Resource locator**Data Quality Statement

Name: Data Quality Statement

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Data quality statement for Inundation Maps for NSW Inland Floodplain Wetlands 2019-2021

Function: download

[2019-2021\\_basin\\_plan\\_reporting](#)

Name: 2019-2021\_basin\_plan\_reporting

Protocol: WWW:DOWNLOAD-1.0-http--download

Function: download

## Unique resource identifier

Code f393ec22-d873-4304-bf08-c13305779684

Presentation form Map digital

Edition 1

Dataset language English

## Metadata standard

Name ISO 19115

Edition 2016

Dataset URI <https://datasets.seed.nsw.gov.au/dataset/f393ec22-d873-4304-bf08-c13305779684>

Purpose Inland wetlands and environmental water management

Status On going

Spatial representation type grid

## Spatial reference system

Code identifying the spatial reference system 4283

Spatial resolution 10 m

Topic category

<b>Keyword set</b>	
keyword value	WATER-Wetlands WATER-Surface
<b>Originating controlled vocabulary</b>	
Title	ANZLIC Search Words
Reference date	2008-05-16
<b>Geographic location</b>	
West bounding longitude	140.910645
East bounding longitude	152.819824
North bounding latitude	-36.321211
South bounding latitude	-28.966697
<b>Vertical extent information</b>	
Minimum value	-100
Maximum value	2228
<b>Coordinate reference system</b>	
Authority code	urn:ogc:def:cs:EPSG::
Code identifying the coordinate reference system	5711
<b>Temporal extent</b>	
Begin position	2019-07-01
End position	N/A
<b>Dataset reference date</b>	
<b>Resource maintenance</b>	
Maintenance and update frequency	Unknown
<b>Contact info</b>	
Contact position	Data Broker
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Responsible party role	pointOfContact

## Lineage

Inundation maps are derived from image observations sourced from the satellite data sources of Landsat (30m pixel) and Sentinel-2 (10m pixel) for the period July 2014- June 2019. Image observations are automatically downloaded by NSW DPIE from the USGS (United States Geological Survey's Earth Explorer website (<http://earthexplorer.usgs.gov> ) and the Copernicus Sentinel Open Access Hub (<https://scihub.copernicus.eu/dhus/#/home> ) as orthorectified images. NSW DPIE process these images to standardised surface reflectance (Flood et al. 2013). Image observations with high cloud coverage (>50%) are not considered because they cannot be processed. The inundation mapping procedure is a modified version of Thomas et. al (2015) which is a method to map inundation in vegetated floodplain wetlands using an integrated spectral response to water and vigorous vegetation. From each satellite image observation NSW DPIE-EES automatically generates a water index (Fisher et al. 2016) and the NDVI vegetation index. These indices are used to allocate inundated pixels to classes of open water, mixed water and vegetation, and dense vegetation cover that was inundated (Thomas et al. 2015). A process of pixel recoding is conducted to produce each inundation map. First all inundation classes are merged and allocated a value of one (1) whilst all other pixels are allocated a value of zero (0). Second, ancillary data is then used to identify irrigation infrastructure to do two things: locate inundated pixels within off-river storages (ORS) by recoding to a value of (2) and to remove cropped areas that have similar spectral properties to wetland vegetation by coding the pixels to a value of zero (0). Third, for observation dates affected by cloud shadow, which is often incorrectly detected as water, pixels are manually reclassified as cloud shadow by recoding them to a value of three (3). The final inundation classes are inundated (1), off-river storages with water (ors) (2), cloud shadow (3), and not inundated (0). Final inundation maps are clipped to the inland floodplain wetland boundaries.

## Limitations on public access

## Responsible party

Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
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Responsible party role	pointOfContact

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Responsible party role	pointOfContact

**Metadata date** 2024-02-26T12:51:40.909995

**Metadata language**